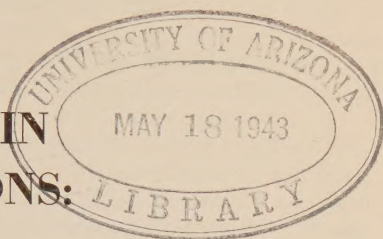
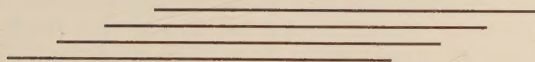


FIBER AND PROTEIN IN TURKEY RATIOMS:



Substitutes to Meet Wartime Needs

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Fiber and Protein in Turkey Rations:

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In the present emergency, necessity demands that feed to produce livestock must be used to its greatest efficiency and only to produce the highest possible quality of product. Because of curtailed production in some cases and unprecedented demand in others, shortages of some feedstuffs are bound to occur. Farmers must take advantage of every possible substitute.

FIBER FEEDS

The results of experiments with fibrous feeds at the Oklahoma Agricultural Experiment Station are of considerable immediate value to farmers in wartime. These trials, over a period of several years, have proved that turkeys over four weeks old can use more fiber in their ration than can chickens. Feeds high in fiber, if fed to poults during the first few weeks of their life, may cause excessive mortality; but after poults are four weeks of age they actually grow more rapidly on some rations high in fiber than on low fiber rations. The reason for the beneficial effect of fiber has not been discovered.

Growing turkeys utilize rations high in fiber but they do not do it efficiently. For example, peanut hulls used as a source of fiber for turkeys have produced good growth. However, the pounds of feed required to produce a pound of Turkey were proportionally greater as the peanut hulls in the ration increased. Fiber seems to dilute the feed, making it necessary for the turkeys to eat more feed to get the same result. Turkey rations usually contain 6 to 8 percent fiber and it is not practical to feed rations containing more than 8 to 10 percent.

Home-grown Alfalfa Can Replace Leaf Meal

The production of alfalfa leaf meal has been curtailed because of shortages of labor and equipment, as well as unfavorable weather in some cases. At the same time the use of this product has increased considerably. All good poultry rations use some alfalfa leaf meal and turkey rations contain a great deal.

Results secured in 1942 indicate that home-grown alfalfa hay can be substituted for the leaf meal in turkey growing rations. Ten percent of pulverized alfalfa hay is usually enough to add but as much as 15 percent may be used without injury to the turkeys. Bright green, leafy hay, should be used. If possible, it should be hay which was cut at a slightly earlier stage of development than usual. Such hay contains more vitamins than bleached, stemmy, or mature hay.

Oats and Barley Can Be Used

Turkey growers need not hesitate to use oats and barley instead of corn because they are fibrous. Tests have shown that turkeys utilize oats and barley well. Growing rations in which oats or barley made up as much as 50 percent of the mash actually gave a better growth than did rations containing only yellow corn. Oats and barley may also be used freely in the whole grain mixture.

Only one precaution is necessary when oats and barley are used as the chief grains in the growing ration. Provision must be made to supply an adequate amount of vitamin A. This is also true when kafir or white corn are used instead of yellow corn in the ration. Alfalfa leaf meal or bright green, leafy alfalfa hay must be used in the mash or fresh tender green feed must be available for the turkeys every day during the growing period.

Older Birds Can Use Corn and Cob Meal

Farmers who grow their own corn may effect a saving in feed preparation by grinding ear corn for their turkeys instead of having it shelled. Corn and cob meal can be used in place of ground shelled corn in the ration after the turkeys are old enough to go on range, but feed consumption per pound of gain will be increased. The turkeys will leave bits of the broken cob in the feeders. The only advantage is the saving in the cost of shelling the corn, and the practice is not generally recommended.

Some Fiber Sources Are Dangerous

An additional word of caution should be given. It is not good practice to dump any kind of trash that happens to be around into the turkey growing mash. Some sources of fiber may be poisonous to the poults. Wood pulp, such as is used to make paper, proved to be very detrimental to chickens.

A ration containing finely ground sugar cane bagasse produced heavy mortality in turkey poults. When 20 percent of sugar cane bagasse was included in the diet, the death loss was 56 percent and the surviving turkeys were badly stunted. Bagasse is a commonly used poultry house litter. Litter eating is not common where good feeding and management are practiced, but may occur at times and result in heavy losses. The first few days that the poults are on the floor are the most critical. It is advisable to use clean coarse sand for litter the first week. After that, any material may be safely used if good feeding practices are followed.

PROTEIN FEEDS

At present the protein feedstuffs are scarce and often difficult to obtain. The protein part of the ration is the most important from the standpoint of the growth of young turkeys. It is also the most expensive. Growers must take advantage of all available knowledge of nutrition to do a good production job economically.

Protein feedstuffs may be conveniently divided into two groups, animal and vegetable. The common animal proteins include milk in all its forms, meat and bone scraps, fish meal and tankage. The commonly available vegetable proteins are cottonseed meal, soybean meal, peanut meal, corn gluten meal and linseed meal. All these protein feedstuffs are scarce and growers should use the least amount possible to get the desired results.

Young Poults Need Milk

Milk is almost an indispensable part of the ration for young poults. It is valuable not only for the high quality protein it contains but also for its vitamin content. Though any form of milk may be used, dried buttermilk and dried skim milk are the most practical. Dried milk can be easily mixed in the ration in definite proportions. It does not require the labor and sanitary precautions necessary in feeding liquid milk. The minimum amount of dried milk for turkey starter rations is four to five percent.

If it is not possible to obtain dried milk, the necessary vitamins may be obtained from dried whey, yeast products, or distillers' grain by-products. These products contain the riboflavin and other vitamins found in milk but not the protein. Alfalfa leaf meal and fresh tender green feed are also

good sources of riboflavin. Older poults will do well on rations without milk if tender green feed in abundance is available every day.

Vegetable Proteins Important Now

Today the bulk of the protein in turkey starters must come from vegetable sources. This is true for two reasons, cost and freedom from excessive minerals. The vegetable proteins are nearly always cheaper than the animal proteins, and in the present emergency they are the most abundant. Trials by the Oklahoma Agricultural Experiment Station have shown that it is not possible to get enough protein for turkey poults by using meat and bone scraps alone without including more minerals in the ration than poults can tolerate. Use of the vegetable proteins, low in mineral content, avoids this difficulty. On the other hand, if no meat and bone meal or fish meal are used, the ration may not have enough minerals.

None of the vegetable proteins contain sufficient riboflavin, so this essential vitamin must be supplied through dried milk, dried whey, alfalfa leaf meal, or fish meal.

In sections where it may be obtained, fish meal is an excellent protein for turkeys. Fish meals contain 60 to 70 percent protein, so only a little is needed in the ration. The protein is of high quality.

Meat and bone scraps is the most commonly used protein supplement in turkey rations. The protein in this product is of fair quality only. Tankage is not good for turkeys or chickens because the protein quality is too low and too variable.

Feeding Tests Give Comparative Values

In recent years the Oklahoma Agricultural Experiment Station has been conducting trials with turkey poults to determine the kinds and amounts of protein feedstuffs that give the best results. These experiments have furnished information that will be especially valuable in the present emergency.

SOYBEAN MEAL.—Results at this station agree with those at other experiment stations that soybean meal is among the best of the vegetable proteins, and may furnish the bulk of the protein in turkey rations.

COTTONSEED MEAL.—Good quality cottonseed meal has proved to be fully equal to soybean meal in turkey rations. In some trials cottonseed meal was definitely superior, and in

other trials it was not as good. Either product may be used in the ration to the extent of 20 percent of the mash. Many rations call for both, but it has not been proved that the combination is any better than either product alone.

PEANUT, CORN GLUTEN, AND LINSEED MEALS.—In one experiment peanut meal, corn gluten meal, and linseed meal were tested.

When used in combination with meat and bone scraps and dried milk, peanut meal and corn gluten meal gave satisfactory growth, nearly as good as cottonseed meal. When used in large amounts—20 percent of the ration or more—peanut meal was slightly inferior and corn gluten meal definitely inferior to soybean meal and cottonseed meal. Linseed meal caused high mortality, and stunted the growth of the survivors. Ten percent or more in the ration caused 100 percent mortality. Linseed meal is not suitable to use in turkey rations.

FORMULATING TURKEY RATIONS

Mashes

The grower who is raising only a few turkeys will find it economical to buy ready mixed starting rations. Mixing of small lots of feed by hand is slow and not thorough. The grower would have to buy ingredients in small quantities, which is difficult in normal times and almost impossible at present. Only five to six pounds of feed per turkey will be needed to grow the poults to eight weeks of age.

Commercial turkey growers may often effect a saving by mixing their own starter ration. They must use a formula that has been tested. Only high quality ingredients should be used. Thorough mixing and sanitation in mixing the feed are necessities.

One hundred growing turkeys will eat 6000 to 7000 pounds of feed from the end of the brooding period to market time. From one-half to two-thirds of this amount will be growing mash. Home mixing of the growing mash may be as practical for growers with smaller flocks as it is for commercial producers.

The feed formulas given in tables I and II have been tested by the Oklahoma Agricultural Experiment Station Poultry Department. They will give satisfactory results if good quality ingredients are used. Starter TS1 has consistently produced the best growth; but it calls for the largest

Table I.—Turkey Starter Rations.
(Feed for the first 6 to 8 weeks.)

	TQ1	TS1	TU1	TV1	TS2729
Ground yellow corn					
or ground kafir	18	20	19	22	16
Ground barley or oats	18	10	19	12	20
Wheat shorts	18	10	19	10	20
Wheat bran	--	10	--	10	--
Alfalfa leaf meal*	10	10	10	6	10
Meat and bone scraps**	10	10	--	10	8
Fish meal	--	--	10	--	--
Cottonseed meal	10	10	16	12	--
Soybean meal	10	10	--	12	--
Peanut meal	--	--	--	--	20†
Dried milk	5	9	4	5	5
Salt	0.5	0.5	0.5	0.5	0.5
Pulverized oyster shell	--	--	2	--	--
Fish liver oil***	0.5	0.5	0.5	0.5	0.5

* Bright green, leafy alfalfa hay, ground fine, may be used.

** Fish meal may be used when obtainable and improves the ration.

*** Guaranteed potency 400 vitamin D units per gram. If 200D oil is used double the amount.

† Soybean meal or cottonseed meal may be used in this ration.

Table II.—Growing and Laying Rations.

	Grower TQ3	Grower TS3	Laying Mash TS4	Laying Mash TV4†
Ground yellow corn				
or ground kafir	17	17	17	15
Ground barley or oats	17	17	17	10
Wheat shorts	17	17	17	20
Wheat bran	16	17	17	25
Alfalfa leaf meal*	8	9	10	6
Meat and bone scraps**	8	9	5	6
Soybean meal	5	6	4	6
Cottonseed meal	5	6	7	6
Dried milk	5	--	4	3
Salt	0.5	0.5	1	1
Pulverized oyster shell	1.5	1.5	1	2
Fish liver oil***	--	--	¼	¼

* Bright green, leafy alfalfa, ground fine, may be used.

** Fish meal may be used when obtainable and improves the ration.

*** Guaranteed potency 400 vitamin D units per gram. Add the same amount of fish liver oil to growing mash if turkeys are raised in confinement.

† Laying mash TV4 may be used as an all purpose laying and growing mash. The fish liver oil need not be fed to turkeys when on range or to breeder hens after April 1 if they are out in yards.

amount of the critical and expensive animal protein feedstuffs. The other starters are almost as good and are often more practical under present conditions.

Grains

All laying and growing mashers should be fed with a mixture of two or more whole grains. Use those grains that are cheapest and most readily available. A mixture of three or more grains is recommended.

Changes may be made in the proportions of the grains any time that price and supply warrant. If a change in the grain mixture is necessary, a grain to which the turkeys are not accustomed should be included in small amount until the birds eat it readily.

The grain mixture should be fed in hoppers to keep it clean and reduce labor. Growing and laying turkeys will balance their own ration if given free choice of a good mash and a mixture of grains.